

What is claimed is:

1. A chemical treatment system comprising:

5 a closed processing cup which subjects a member to be treated to chemical treatment while circulating therein a treatment fluid at a certain pressure and a certain flow rate;

a fluid reservoir tank for storing the treatment fluid; and a pump for supplying the treatment fluid from the fluid reservoir tank to the closed processing cup, wherein

10 the pump periodically changes at least either the pressure or flow rate of the treatment fluid in the closed processing cup.

2. The chemical treatment system according to claim 1, wherein the pump is constituted of a pulsating pump, and the pulsating pump  
15 periodically changes at least either the pressure or flow rate of the treatment fluid in the closed processing cup.

3. The chemical treatment system according to claim 2, wherein the pulsating pump is constructed of a bellows pump and the bellows  
20 pump periodically pulsates a bellows, to thereby supply the treatment fluid to the closed processing cup, thus periodically changing at least either the pressure or flow rate of the treatment fluid circulating through the closed processing cup.

25 4. The chemical treatment system according to claim 2, wherein the pulsating pump is constructed of a diaphragm pump, and the diaphragm pump periodically pulsates a diaphragm, to thereby supply the treatment fluid to the closed processing cup, thus periodically changing at least  
30 either the pressure or flow rate of the treatment fluid circulating through the closed processing cup.

5. The chemical treatment system according to claim 1, further comprising: a supply channel for supplying the treatment fluid to the closed processing cup, a discharge channel for discharging the treatment  
35 fluid from the closed processing cup, and a flow throttle valve provided in the discharge channel.

6. A chemical treatment system comprising:

40 a closed processing cup which subjects a member to be treated to chemical treatment while circulating therein a treatment fluid at

a certain pressure and a certain flow rate;

a fluid reservoir tank for storing the treatment fluid; and

a pumping apparatus for supplying the treatment fluid from the fluid reservoir tank to the closed processing cup, wherein

5 the flowing direction of the treatment fluid within the closed processing cup is periodically changed.

7. The chemical treatment system according to claim 6, wherein the closed processing cup has first and second treatment fluid flow  
10 ports, and the pumping apparatus has first and second pumps; and wherein the first pump circulates the treatment fluid in the closed processing cup from the first treatment fluid flow port to the second treatment fluid flow port, and the second pump circulates the treatment fluid in the closed processing cup from the second treatment fluid flow port  
15 to the first treatment fluid flow port.

8. The chemical treatment system according to claim 7, further comprising:

a first treatment fluid channel to be connected to the first  
20 treatment fluid flow port of the closed processing cup;

a second treatment fluid channel to be connected to the second treatment fluid flow port of the closed processing cup;

a first flow regulation valve provided in the first treatment fluid flow channel; and

25 a second flow regulation valve provided in the second treatment fluid flow channel,

wherein, when the treatment fluid flows from the first treatment fluid flow port to the second treatment fluid flow port in the closed processing cup, the second flow regulation valve provided in the second  
30 treatment fluid flow channel connected to the second treatment fluid flow port is taken as a flow throttle valve; and wherein, when the treatment fluid flows from the second treatment fluid flow port to the first treatment fluid flow port, the first flow regulation valve provided in the first treatment fluid flow channel connected to the first treatment  
35 fluid flow port is taken as a flow throttle valve.

9. The chemical treatment system according to claim 1, wherein the member to be treated has a plurality of blind holes which are closed at one end and open at the other end, and a surface of the member, including  
40 interior surfaces of the blind holes, is subjected to chemical treatment

while the member is placed in the closed processing cup such that openings of the blind holes remain in contact with the circulating treatment fluid.

5           10. The chemical treatment system according to claim 1, wherein  
the member to be subjected to treatment is a semiconductor wafer; the  
semiconductor wafer has a plurality of via holes which are closed at  
one end and open at the other end; and a surface of the semiconductor  
10   wafer, including interior surfaces of the via holes, is subjected to  
chemical treatment while the semiconductor wafer is placed in the closed  
processing cup such that openings of the via holes remain in contact  
with the circulating treatment fluid.

15           11. The chemical treatment system according to claim 1, wherein  
the member to be subjected to treatment is a printed board; the printed  
board has a plurality of through holes which are closed at one end and  
open at the other end; and a surface of the semiconductor wafer, including  
interior surfaces of the through holes, is subjected to chemical treatment  
20   while the semiconductor wafer is placed in the closed processing cup  
such that openings of the through holes remain in contact with the  
circulating treatment fluid.